



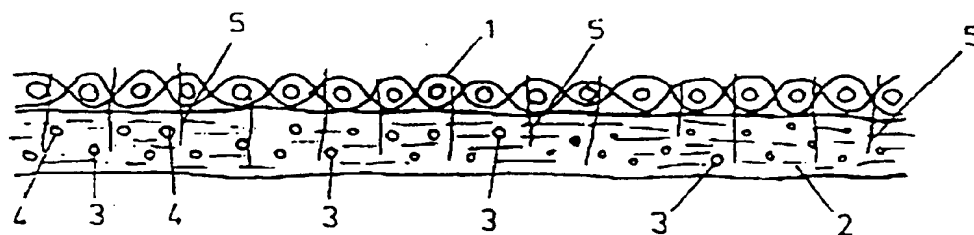
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(51) Int.Cl.<sup>6</sup> E02B 3/04

(54) **MATTE POUR PLANTES PROTEGEANT CONTRE L'EROSION**

(54) **EROSION PROTECTION AND PLANT MAT**



(57) An erosion protection and plant mat is provided with at least one wide-mesh fabric made of durable, decayable organic fibers, preferably sisal and/or coconut fibers, with a nonwoven, which is connected to its underside. A connecting means is provided for holding together the fabric and the nonwoven. The nonwoven and the fabric are connected to one another by pinning. The connecting means are individual fibers of the nonwoven arranged on the underside of the fabric. The majority of the nonwoven element is preferably formed of decayable fibers, with plant seeds embedded therein.



## ABSTRACT OF THE DISCLOSURE

An erosion protection and plant mat is provided with at least one wide-mesh fabric made of durable, decayable organic fibers, preferably sisal and/or coconut fibers, with a nonwoven, which is connected to its underside. A connecting means is provided for holding together the fabric and the nonwoven. The nonwoven and the fabric are connected to one another by pinning. The connecting means are individual fibers of the nonwoven arranged on the underside of the fabric. The majority of the nonwoven element is preferably formed of decayable fibers, with plant seeds embedded therein.

Docket # 56926

## ***EROSION PROTECTION AND PLANT MAT***

### **FIELD OF THE INVENTION**

The present invention pertains to an erosion protection and plant mat with at least one wide-mesh fabric made of durable, decayable organic fibers, preferably sisal and/or coconut fibers, with a nonwoven, which is connected to its underside, and the majority of which preferably consists of decayable fibers, with plant seeds embedded therein, and with connecting means holding together the fabric and the nonwoven.

### **BACKGROUND OF THE INVENTION**

An erosion protection and plant mat of this type has been known from EP 0 450

346 B1. Fabrics and nonwovens are firmly connected there by means of threads or yarns, which consist of a material that loses its strength under the action of moisture and dampness and dissolves. When this mat is exposed to damp weather conditions, the connecting means holding together the fabric and the nonwoven gradually dissolve, and the nonwoven containing the plant seeds sinks and comes to lie directly on the soil to be protected. The high expense of connecting the fabric and nonwoven by means of the threads and yarns used as the connecting means is a drawback.

## SUMMARY AND OBJECTS OF THE INVENTION

The basic object of the present invention is to simplify the manufacture of this erosion protection and plant mat.

According to the invention, an erosion protection and plant mat is provided with at least one wide-mesh fabric made of durable, decayable organic fibers, preferably sisal and/or coconut fibers, with a nonwoven, which is connected to its underside. A connecting means is provided for holding together the fabric and the nonwoven. The nonwoven and the fabric are connected to one another by pinning. The connecting means are individual fibers of the said nonwoven arranged on the underside of the fabric. The majority of the nonwoven element is preferably formed of decayable fibers, with plant seeds embedded therein.

The connecting fibers are preferably not soluble in water.

The fabric and the nonwoven arranged on its underside are connected to one

another according to the present invention by pinning, wherein the connecting means are individual fibers of the nonwoven arranged on the underside of the fabric. The fibers are stuck into the threads of the fabric during pinning by means of special machines and needles with barbs and are fixed there. The fibers of the nonwoven are thus used as connecting means, so that no additional connecting means are necessary, and the manufacture of the mat is thus substantially simplified. The number of fibers holding together the fabric and the nonwoven is so small that the individual connecting fibers of the nonwoven break and are torn out of the fabric under the action of moisture and dampness and the associated increase in the weight of the nonwoven when wetness (rain) enters and the weight of the nonwoven increases correspondingly due to the absorption of water. The connection between the fabric and the nonwoven is thus interrupted, and the nonwoven, interspersed with seeds and optionally fertilizer, separates from the fabric, which undergoes intense shrinkage under the effect of weather and whose length decreases as a result, and which is raised, e.g., between two adjacent supports, e.g., stones, and the nonwoven sinks to or remains on the soil, and the germinating seeds and their roots find the conditions necessary for their growth. The connection of the fabric and the nonwoven is arranged homogeneously over the flat-shaped textile article.

It has been known from DE-OS 2158914, which pertains to a field which is different from that of the present invention, that two identical nonwovens used for planting can be firmly connected to one another by pinning. A composite consisting

of two layers of fiber roller peat, which have the same material, which are connected to one another by fibers or threads, has been known from DE-OS 3400696. However, the underlying problems of the present invention do not occur here, because the composite consists of two identical materials, which display the same behavior under the effects of weather.

The corrosion protection and plant mat according to the present invention will be explained in greater detail below on the basis of an exemplary embodiment of the present invention and of a mat of a design which is known.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which a preferred embodiment of the invention is illustrated.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Figure 1 is a schematic representation of a longitudinal section through a mat,

Figure 2 is the mat according to Figure 1 on a soil to be reinforced, which is interspersed with large stones,

Figure 3 corresponds to the representation according to Figure 2, but after exposure to the effects of the weather with high moisture content, and

Figure 4 is a representation corresponding to Figure 3, but the behavior of a mat of a prior-art design is shown here.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in particular, the invention as shown in Figure 1 includes a wide-mesh fabric 1 made of sisal or coconut fibers which carries on its underside a nonwoven structure 2, which is preferably made of dark fibers or fibers dyed in a dark color. A wide-mesh fabric 1 in the sense of the present invention is defined as a fabric that has relatively large pore volumes between the threads, a so-called loose fabric. Plant seeds 3 are embedded in the above-mentioned nonwoven 2, and a fertilizer may preferably also be enclosed by the nonwoven structure 2. The fabric 1 and the nonwoven 2 are connected to one another in the factory by individual fibers, which, arriving or extending from the nonwoven, are fixed in the fabric. These connecting fibers break under the weight load at the moment at which the nonwoven, weighted by rainwater, assumes a weight that is several times its original weight and sinks on the soil to be protected.

Figure 2 illustrates how the mat manufactured in the factory, as it is seen in Figure 1, is laid on a soil 6 to be protected, wherein the soil is covered with relatively large stones 7. The mat is laid such that it hangs through between adjacent stones 7 and comes to lie on the soil to be fastened. To fix the position of the mat, especially in the case of sloping soil surfaces, anchors may be fastened in the soil at various

points, and the mat is then nondetachably connected to these anchors.

If the mat is exposed to wet effects of the weather, the connecting fibers break under the weight of the rain-soaked nonwoven, and the connection between the nonwoven 2 and the fabric 1 is thus interrupted, so that the fabric, which shrinks intensely under the said effects of the weather and whose length decreases as a result, is raised as a consequence between adjacent supports, here between the stones 7, but the nonwoven 2, interspersed with seeds and optionally fertilizer, now remains on the soil 6, and the germinating seeds and their roots find the conditions necessary for their growth.

In contrast, a mat, in which the nonwoven and the fabric are connected with threads or yarns of the prior-art type, shows the picture that is schematically shown in Figure 4: The mat, raised between two adjacent supports (stones 7) as a consequence of the shrinkage, inherently pulls the nonwoven 2 connected to it, thus lifting it off from the soil 6, and the roots 8 of the germinating seeds hang freely in the air, withering in a short time. Since the above-mentioned shrinkage process is irreversible, the germinating seeds cannot grow in this case, and the seed cannot assume its intended role.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.



**WHAT IS CLAIMED IS:**

1. An erosion protection and plant mat, comprising:

at least one wide-mesh fabric made of durable, decayable organic fibers;

a nonwoven element connected to an underside of said wide-mesh fabric, a majority of said nonwoven element consisting of decayable fibers;

5 plant seeds embedded in said nonwoven element; and

connecting means holding together the fabric and the nonwoven, said connecting means including individual connecting fibers of said nonwoven element arranged on an underside of said fabric, said fabric and said nonwoven being connected to one another by pinning.

2. The erosion protection and plant mat in accordance with claim 1, wherein said decayable organic fibers of said fabric are at least one of sisal and coconut fibers.

3. The erosion protection and plant mat in accordance with claim 1, wherein said connecting fibers are not soluble in water.

4. An erosion protection and plant mat, comprising:

at least one wide-mesh fabric made of durable, decayable organic fibers;

a nonwoven element connected to an underside of said wide-mesh fabric, said

nonwoven element including decayable fibers;

5 plant seeds embedded in said nonwoven element; and

connecting means holding together the fabric and the nonwoven, said connecting means including individual connecting fibers of said nonwoven element arranged on an underside of said fabric, said fabric and said nonwoven being connected to one another by pinning.

5. The erosion protection and plant mat in accordance with claim 4, wherein a majority of said nonwoven element consists of decayable fibers.

6. The erosion protection and plant mat in accordance with claim 4, wherein said decayable organic fibers of said fabric include sisal fibers.

7. The erosion protection and plant mat in accordance with claim 4, wherein said decayable organic fibers of said fabric include coconut fibers.

8. The erosion protection and plant mat in accordance with claim 4, wherein said connecting fibers are not soluble in water.

Fig.1

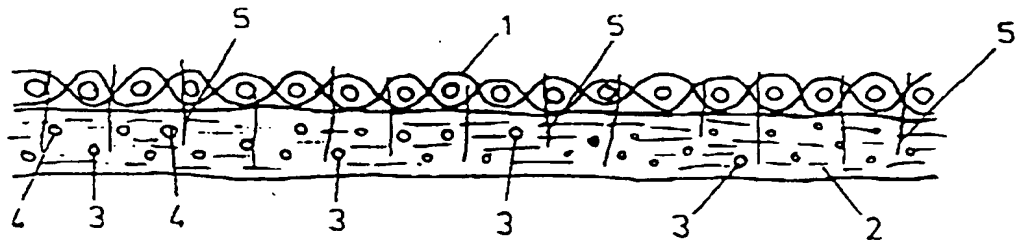


Fig. 2

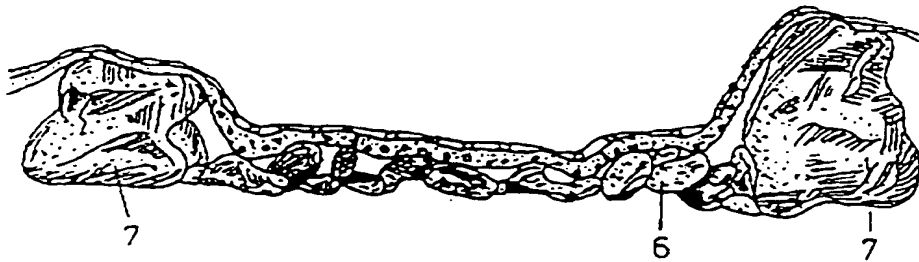


Fig. 3

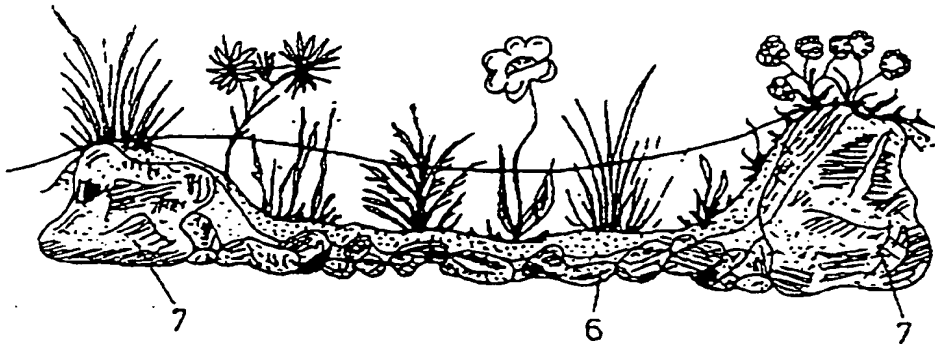
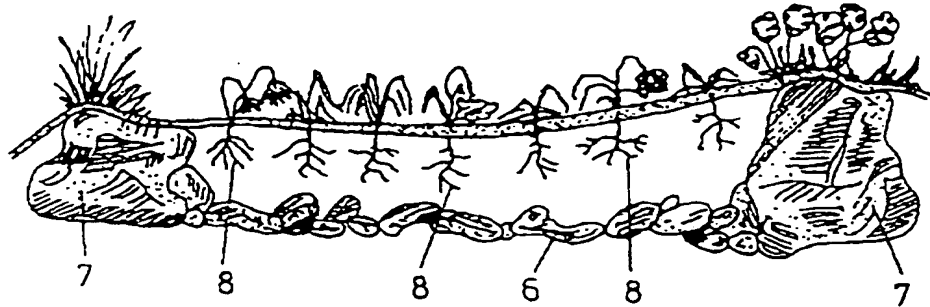


Fig. 4



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